Math 4

Units 3.4

Workbook

we explore

Math 4
Units 3,4

Math 4 Learn EveryWare – Units 3 and 4 Workbook
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Math 4 Units 3,4

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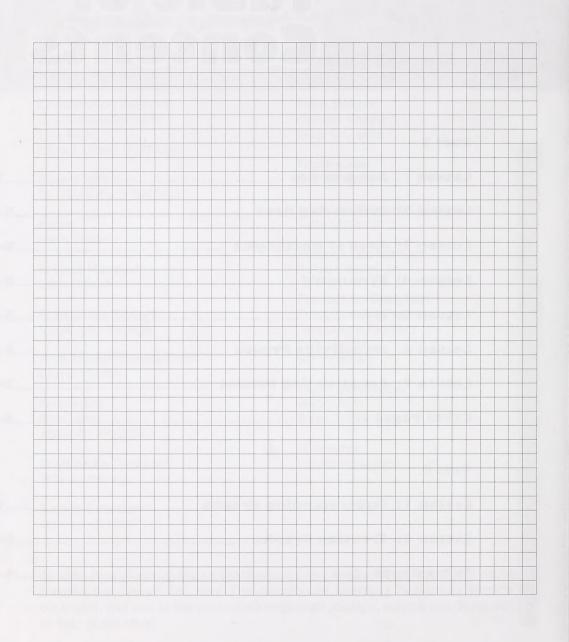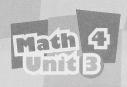
Congruence

Let's Explore

Exploration 1: Making Congruent Shapes

Materials: Construction paper, Scissors, Pencil

1. Fold your construction paper in half. Fold the paper in half again.

2. Draw a simple shape on the top of your folded paper.

3. Cut the outside lines of your shape.

4. You should now have 4 congruent shapes.

5. What makes your shapes congruent?

6. Repeat the process to make another set of congruent shapes.

Let's Explore
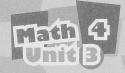
Exploration 2: Changing Positions
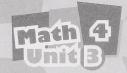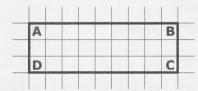
Materials: 2 sheets of grid paper, from the back of this Unit in your Workbook, Scissors, Pencil

1. Draw a rectangle on the first sheet of grid paper. Label the inside corners of the rectangle **A**, **B**, **C**, **D** like this:

2. Draw a triangle on the first sheet of grid paper. Label the inside corners **E**, **F**, **G**.

3. Draw your own shape on the grid paper. Make sure that each vertex of your shape is on a place where the gridlines cross. Label the inside corners.

4. Cut out your 3 shapes.

5. On the other sheet of grid paper trace the rectangle and label the corners that you traced.

6. TURN the rectangle and trace it in another position on the grid paper. Label the corners with letters you haven't used yet.
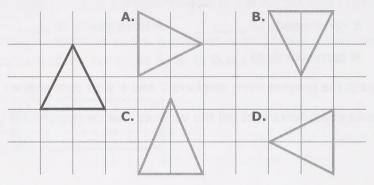
7. Complete the following:

   A corresponds to _____.   **B** corresponds to _____.

   C corresponds to _____.   **D** corresponds to _____.

8. Repeat the process from numbers 5 and 6 with your triangle.

9. Complete the following for your triangle:

   E corresponds to _____.   **F** corresponds to _____.

   G corresponds to _____.

10. Repeat the process from numbers 5 and 6 with your shape.

11. Create statements that tell the vertices that correspond for your shape.

12. Reflect: How does moving the shape across the grid paper help you find corresponding parts?
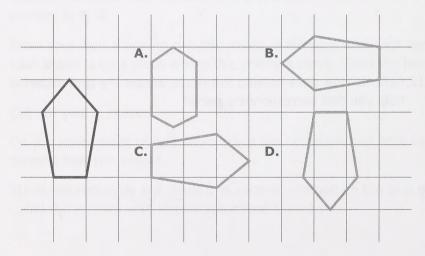
Let's Practice

For 1 – 3: Which of the following are NOT congruent to the figures shown? Circle the figure that is not congruent to the first figure.

1.

A.

B.

C.

D.

2.

A.

B.

C.

D.

3.

A.

B.

C.

D.
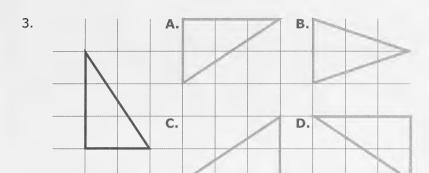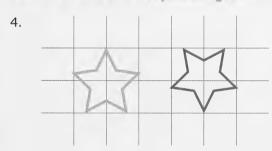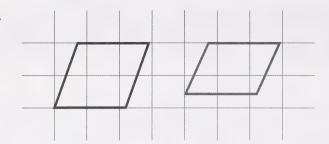
For 4 - 6: Are the shapes congruent?

4.

5.
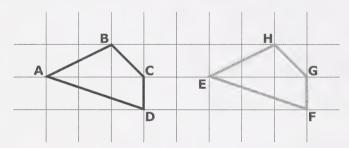
6.

For 7 - 9: Identify the corresponding parts of the given congruent figures.

7.

A corresponds to _____   side **AB** corresponds to side _____

B corresponds to _____   side **BC** corresponds to side _____

C corresponds to _____   side **CD** corresponds to side _____

D corresponds to _____   side **DA** corresponds to side _____

8.

A corresponds to _____   side **AB** corresponds to side _____

B corresponds to _____   side **BC** corresponds to side _____

C corresponds to _____   side **CD** corresponds to side _____

D corresponds to _____   side **DA** corresponds to side _____

9.
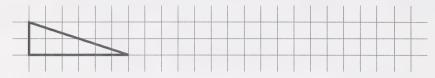
P corresponds to _____   side **PQ** corresponds to side _____

Q corresponds to _____   side **QR** corresponds to side _____

R corresponds to _____   side **RP** corresponds to side _____
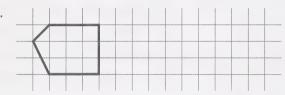
For 10 – 12: Use the grid paper to draw an image congruent to the given shape.

10.

11.

12.

13.   Reflect: Name and describe three figures in your home or classroom that are congruent.

Mixed Review

Solve.

1. $\boxed{} + 7 = 12$

2. $\boxed{} - 6 = 8$

3. $\boxed{} \times 8 = 24$

4. $\boxed{} \div 4 = 7$

5. $\boxed{} + 1.25 = 3.45$

Lesson 2

Estimating Area
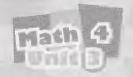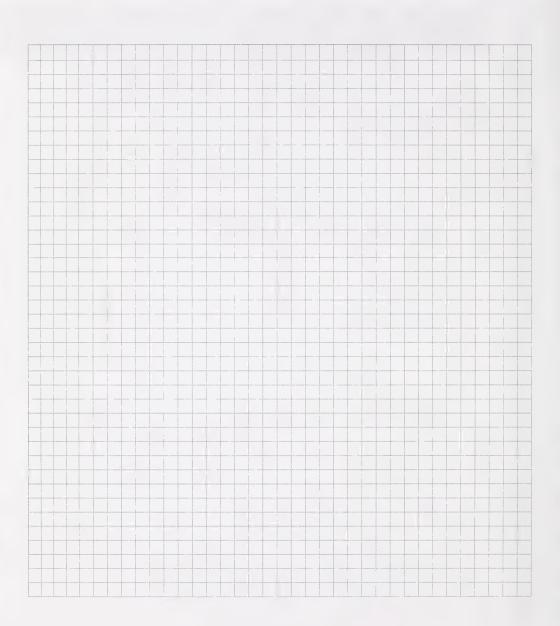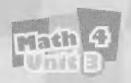
Let's Explore
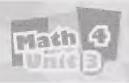
Exploration 1: Estimating Area

Materials: Exploration 1 pages from the back of this Unit in your Workbook, Dry lima beans, Pencil, Paper, Scissors

Cut-out the squares and rectangles from the pages labelled Exploration 1, at the back of this Unit in your Workbook. Pull out the pages with Figures 1 to 5 on them. You don't need to cut those five figures out. Keep your squares when you are done, because you will use them again in another lesson.

Procedures:

1. Use your dry beans to cover the figures.

2. In the table, record the number of beans that cover each figure.

3. Use the circle cut-outs to cover each figure.

4. In the table, record the number of circles that cover each figure.

5. Use the rectangle cut-outs to cover each figure.

6. In the table, record the number of rectangles that cover each figure.
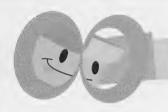
7. Use the square cut-outs to cover each figure.

8. In the table, record the number of squares that cover each figure.

	Number of Beans to Cover Figure	Number of Circles to Cover Figure	Number of Rectangles to Cover Figure	Number of Squares to Cover Figure
Figure 1				
Figure 2				
Figure 3				
Figure 4				
Figure 5				

9. Reflect: Which shape (bean, circle, rectangle or square) do you think is the best to cover each figure? Why?

Let's Explore
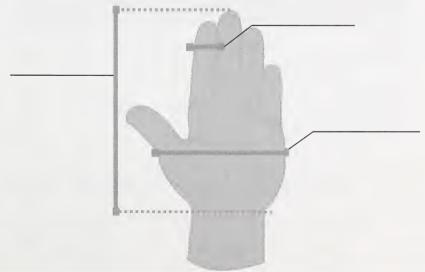
Exploration 2: Hand Measures

Materials: Centimetre grid paper, from the back of this Unit in your Workbook, Pencil, Paper

1. Place your hand with fingers together on a sheet of centimetre grid paper.

2. Trace your hand.

3. Measure the width of your hand as shown in the image.

4. Measure the length of your hand from the tip of your middle finger to the wrist.

5. Measure the width of your pointer finger.

6. Use your hand measures to estimate the measure of 5 objects in the room.

Label these parts on the image shown.

Let's Explore

Exploration 3: Measuring Area

Materials: 5-Centimetre Square from the back of this Unit in your Workbook, Metre stick, Pencil, Scissors

Measure the following objects using a metre stick. Estimate the area.

1. A wall in your classroom or home

2. The space taken up on the floor by a sofa

3. A table top

4. The floor of your classroom or living room

5. Estimate the area of 4 other objects in square metres.

Object	Estimated Area
Wall	
Floor Space of Sofa	
Table Top	
Floor of Living Room	
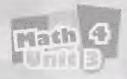
Cut out the 5-Centimetre Square from the back of this Unit in your Workbook. Measure the following objects using the square. The area of this square is 25 square centimetres. If it takes 2 of these to cover an object, the area is 50 square centimetres. Estimate the area.

6. Your desktop

7. Your footprint

8. A picture frame

9. The cover of a book

10. Estimate the area of 4 other objects in square centimetres using your 5-centimetre square.

Object	Estimated Area
Desktop	
Footprint	
Picture Frame	
Book Cover	

11. What is the best unit of measure for the desktop?

12. What is the best unit of measure for the floor of the living room?

13. Why did you choose the objects in number 5? Was it best to measure them with the square metre?

14. Why did you choose the objects in number 10? Was it best to measure them with the 5-centimetre square?

15. Reflect: What other size unit square could you use to measure objects in your environment? Why would it work best?

Let's Practice

1. In your own words, write a description of what it means to find the area of an object.
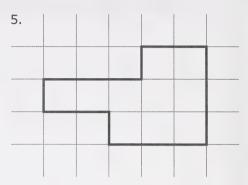
2. What it the most efficient unit for measuring area? Why?
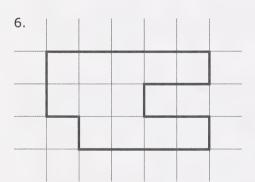
3. Alyssa and Lian are measuring their desktops. Alyssa is using a Loonie to measure the area of her desktop. Lian is using a postage stamp. Who will get the closest measure and why?
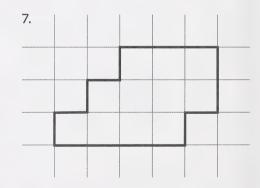
For 4 – 7: Find the area of the figures. The figures are drawn on centimetre grid paper.

4.

5.

6.

7.
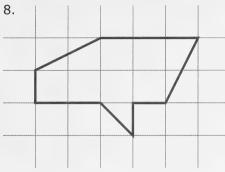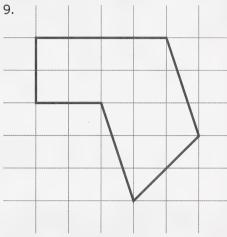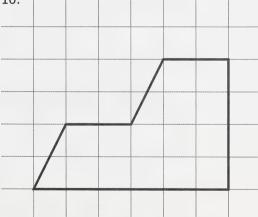
For 8 - 11: Estimate the area of the figures. The figures are drawn on centimetre grid paper.

8.

9.
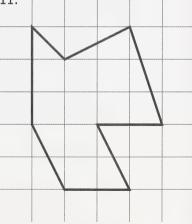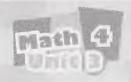
10.

11.

12. Cameron is measuring a football field by taking small steps. He estimates that three steps is about one metre. Describe how Cameron could estimate the area of the football field in this way.

For 13 - 16: Determine if the object is about one metre square or about one centimetre square.

13. A poster

14. The top of a card table

15. A side of a die

16. A fingernail

For 17 - 20: Would you measure the object in square metres or square centimetres?

17. A calculator

18. A parking space

19. A five dollar bill   20. The floor of a living room

21. Reflect: What are two objects you would measure in square centimetres? What are two objects you would measure in square metres? Why?

Mixed Review

1. Finish the pattern: 3, 9, 15, 21, _____, _____, _____

2. Use the pattern to complete the table:

A	B
2	7
4	
6	
	13
	15
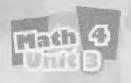
For 3 – 5: Find the perimeter of the following rectangles.

3.

8

1   1

8

4.

6

3   3

6

5.

4

5   5

4

6.   What did you notice about the perimeter of the figures in 3, 4, and 5?

Lesson 3

Area of Rectangles

Let's Explore

Exploration 1: Multiple Rectangles

Materials: Cut-out Squares, Pencil

1. Gather 24 squares.

2. Make a rectangle with the squares. Record the side lengths.

3. Continue to make as many rectangles as you can for an area of 24 square units. Record the side lengths.

4. Gather 36 squares.

5. Make as many rectangles as you can for an area of 36 square units. Record the side lengths.

6. Gather 23 squares.

7. Make as many rectangles as you can for an area of 23 square units. Record the side lengths.

8. Make a rectangle using any number of squares.

9. What is the area of your rectangle? Record the area and side lengths.

10. Make as many rectangles as you can with this area. Record the side lengths.

11. Reflect: Why is there more than one rectangle for some and only one for others?

Let's Practice

For 1 - 6: Create one rectangle that has the given area. Draw and label the sides.

1. 12 square units

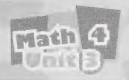2. 9 square units

3. 18 square units

4. 24 square units

5. 27 square units

6. 32 square units

For 7 - 12: Create as many rectangles as you can for the given area. Draw each and label the sides.

7.   8 square units

8.   10 square units

9.　12 square units

10.　15 square units

11. 16 square units

12. 20 square units

13. How many rectangles are there with an area of 24 square units?

14. How many rectangles are there with an area of 42 square units?

15. Reflect: Describe the relationship between the area of a rectangle and the multiplication array of the rectangle.

Mixed Review

1. How many days are in the month of August?

2. How many minutes are in 12 hours?

3. It took Alyssa 120 minutes to clean her room. How many hours did it take her to clean her room?

4. Use the ruler below to draw a line segment that is 5 cm long.

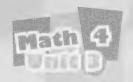**For 5 - 8: Match the following figures with the appropriate name:**

A.

B.

C.

D.

5. _____ Quadrilateral

6. _____ Pentagon

7. _____ Hexagon

8. _____ Octagon

Lesson 4

Let's Explore

Exploration 1: Letters with Symmetry

Materials: Pencil, Paper

1. Fold a piece of paper in half. Write your name in all capital block letters across the fold of the paper.

~~DAKSHA~~

2. Look at the two halves of each letter. Are the two halves the same?

   If a shape can be folded in half so that one half fits exactly on top of the other, then we say that the shape has line symmetry.

   The fold is called a line of symmetry.

   Letters that have this fold as a line of symmetry are said to have a horizontal line of symmetry

3. List all of the letters in your name that have a horizontal line of symmetry.
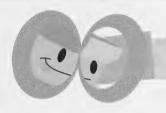
4. Look at the letters:

   a b c d e f g h i j k l m n o p q r s t u v w x y z

   A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

5. Do any have lines of symmetry? List them and draw the line of symmetry.

6. Do any letters have more than one line of symmetry? List them and draw all lines of symmetry.

Let's Explore

✎ **Exploration 2: Design a Stained Glass Window**

Materials: Paper, Pencil, Coloured pencils

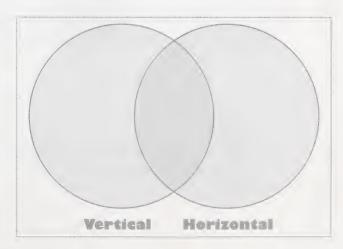**Optional materials:** construction paper, tissue paper

Try making your own stained glass window pattern. Use shapes from this lesson to help you. Show how your window pattern uses symmetry.

Let's Practice
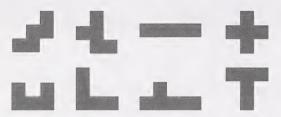
1. Use the Venn diagram to sort capital letters by their symmetry.
    Use horizontal symmetry or vertical symmetry.

    A, B, C, D, E, F,
    G, H, I, J, K, L,
    M, N, O, P, Q, R,
    S, T, U, V, W, X,
    Y, Z

    Vertical   **Horizontal**

2. Sort the Pentominoes into the Carroll Diagram.

Line of Symmetry	No Line of Symmetry

3. Name a shape in your room that has one or more lines of symmetry. Describe the symmetry in words.

4. Name a shape in nature that has one or more lines of symmetry. Describe the symmetry in words.

5. Name an article of clothing you own that has symmetry.
   Why does it have that symmetry?

For 6 – 8: Complete the other half of each figure so that the two halves are symmetric.

6.

7.

8.

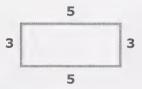**For 9 – 14: Draw all the lines of symmetry for each figure below.**

9.

10.

11.

12.

13.

14.

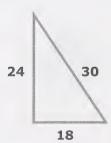15. Reflect: Why do you think symmetry is used in art?

Mixed Review

Find the perimeter of each shape.

1.

```
      5
   ┌──────┐
3  │      │  3
   └──────┘
      5
```

2.

```
   │\
   │ \
24 │  \ 30
   │   \
   │____\
     18
```
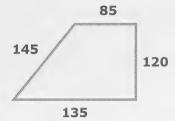
3.

85

145

120

135
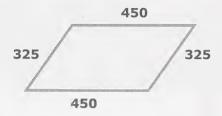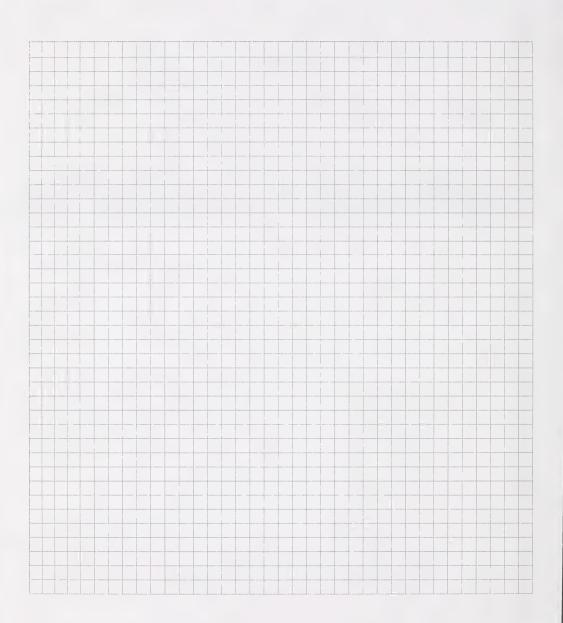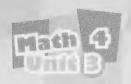
4.

450

325

325

450

5. Create your own figure that has a perimeter of 20.

Lesson 5

Time

Let's Explore

Exploration 1: Make Your Own Clock

Materials: Clock Pattern from the back of this Unit in your Workbook, Brad, Hole punch, Pencil

To make the clock:

1. Cut out the clock pattern found at the end of this Unit in your Workbook.

2. Cut out the minute and hour hand patterns.

3. Put the hour hand on top of the minute hand so they line up at the flat end.

4. Punch a hole in the hands.

5. Put the brad through the holes and poke it through the dot in the middle of the clock pattern.

6. Attach the brad loosely on the back. The hands should be able to move freely.

Make these times with your clock:

7. 9:15   8. 10:45   9. 2:05   10. 12:30

11. twenty to seven o'clock   12. twelve after eight o'clock

13. Make three times of your own on your clock. Write the times in numeric and word form.

Let's Practice

For 1 – 5: Is it AM or PM?

1. Alyssa is at the mall with her friends after school. _____

2. The kids are cooking dinner by the campfire and have flashlights on. _____

3. It is light outside and Zach is called by his mother to come in for dinner. _____

For 4 - 12: What time is displayed on the clock? Describe the time in words and write numeric time.

4. You would say:
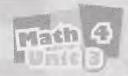
    _____

    You would write: _____

5. You would say:

    _____

    You would write: _____

6. You would say:

    _____

    You would write: _____

7. You would say:

   _____

   You would write: _____

8. You would say:

   _____

   You would write: _____

9. You would say:

   _____

   You would write: _____

10. You would say:

_____

You would write: _____

11. You would say:

_____

You would write: _____

2:34 PM

12. You would say:

_____

You would write: _____

12:48 AM

13. It is dark outside. The clock face is as shown.

Write the time: _____

14. Draw the hands on the clock for the time 1:45.

For 15 – 17: Name the date on the calendar in these formats:

JUNE 2009

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

15. DD/MM/YY _____

16. MM/DD/YYYY_____

17. YYYY/MM/DD _____

For 18 - 20: Name the date on the calendar in these formats:

JUNE 2009

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

18. MM/DD/YY _____

19. MM/DD/YYYY_____

20. YYYY/MM/DD _____

For 21 – 23: Circle the following dates on the calendar.

SEPTEMBER 2009

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			
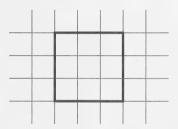
21. 2009/09/14

22. 09/20/09

23. September 25, 2009

24. Reflect: Think about what day of the week your birthday is on this year. Now find out what day of the week your birthday will be on next year. You can use a calendar. What does that tell you about how the calendar year works?

Mixed Review

1. Add. 3.45 + 8.12 _____

2. Subtract. 345 – 128 _____

3. Name this shape. _____
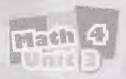
4. Name this shape. _____
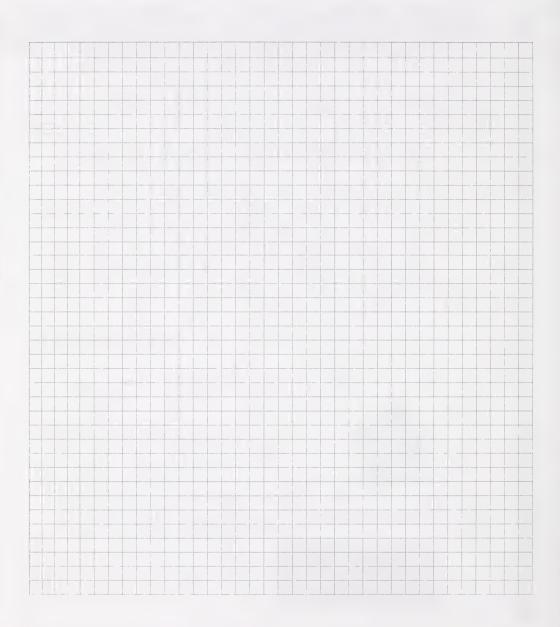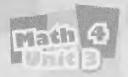
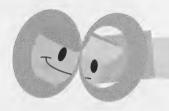5. Name this shape. _____

Lesson 6

Identifying Prisms

Let's Explore

Exploration 1: Cereal Box Prism

Materials: A cereal box

Do the following:

1. Take your cereal box and sit it on the table in front of you the way it would sit on the grocery store shelf.

You are looking at a rectangular prism.

2. Put your hand on the "top" of the box.

    If you decide this is a base of the
    rectangular prism then where is the
    other base?

    It is on the "bottom" or the side that
    is on the table.

3. Put your hand on one "side" of the box and
    put the other on the opposite side.

    You now have your hands on two
    bases of the box.

4. Put your hand on the front of the box and
    the other hand on the back.

    You could also call these two sides the
    bases of the box.

All of the sides of the box you have just touched or identified can be called faces. There are SIX faces on a rectangular prism. Two of these faces can be called the bases. It doesn't matter which two you choose to be the bases as long as you pick two that are parallel and congruent.

Let's Explore

Exploration 2: Toothpick Rectangular Prism
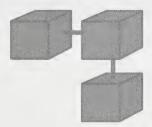
Materials: Cheese cubes, Toothpicks, Pencil

Procedures:

1. Create a rectangular prism using your materials.

   You will use the cheese cubes as connectors for the toothpicks. When you connect the pieces you want to follow the example:

   **Connect them like this:**   **NOT like this:**

2. Place your constructed rectangular prism on the blue mat. Look at your neighbour's prism. Does it look like yours? Should it? Explain.

3. Describe the faces of the rectangular prism.

4. Record the number of vertices, edges and faces in the table.

Figure	Number of Faces	Number of Edges	Number of Vertices
Rectangular Prism			

Let's Explore

Exploration 3: Creating a Triangular Prism

Materials: Cheese cubes, Toothpicks, Pencil

1. Create a triangular prism using the provided materials. Use the same method of connecting the cheese cubes and toothpicks that you used in Exploration 2.
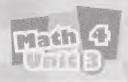
2. Place your constructed triangular prism on the blue mat. Next, look at your neighbour's prism. Does it look like yours? Should it? Explain.

3. What part of a prism do the toothpicks represent?

4. What part of a prism do the cheese cubes represent?

5. What represents the faces of the triangular prism?

6. Complete the table with this information.

Figure	Number of Faces	Number of Edges	Number of Vertices
Triangular Prism			
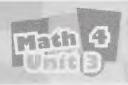
Putting it all Together

7. Complete the table that compares rectangular prisms and triangular prisms.

Figure	Number of Faces	Number of Edges	Number of Vertices
Rectangular Prism			
Triangular Prism			

8. How are rectangular and triangular prisms alike?

9. How are rectangular and triangular prisms different?

10. Can you always stack rectangular prisms? How about triangular prisms?

11. If you created a new brand of cereal, what shape would you make the cereal box?

12. Explain why you use the two terms, face and base.

Let's Practice

1. Draw a line from the word label to where it belongs on the rectangular prism.

   Vertex

   Edge

   Face

2. How many vertices does a rectangular prism have?

3. How many faces does a rectangular prism have?

4. How many edges does a rectangular prism have?

5. What shape is the base of a rectangular prism?

6. Fill in the blank with **point**, **line segment**, or **polygon**.

   A vertex is a _____.

   A face is a _____.

   An edge is a _____.

7. Draw a line from the word label to where it belongs on the rectangular prism.

   Vertex
   Edge
   Face

8. How many vertices does a triangular prism have?

9. How many faces does a triangular prism have?

10. How many edges does a triangular prism have?

11. What shape is the base of a triangular prism?
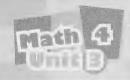
For 12 - 14: Solve the "What am I?" Riddles.

12. I am a prism and have six faces. All six faces are rectangles. What am I?

13. I am different, because I am all the same. I am a prism and have six faces that are congruent squares. What am I?

14. I am a prism that only has five faces. Two are triangles and three are rectangles. What am I?

For 15 - 18: Name the figure shown.

15. _____
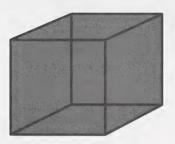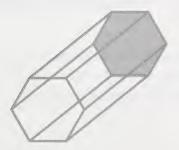
16. _____

17. _____

18. _____

19. What is the shape of the base of a pentagonal prism? Draw the shape of the base and name it.
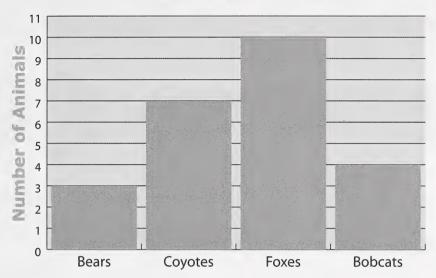
20. Reflect. Complete this thought:

    The key ideas for this lesson were...

Mixed Review

For 1 – 5: The bar graph shows the number of animals that a group of hikers were able to observe in Banff National Park. Use the bar graph to answer the following questions.
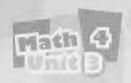
Animals Observed on Hiking Trip to Banff National Park

1. What type of animal did they see most often?

2. How many coyotes were seen on the hiking trip?

3. How many bobcats were seen on the hiking trip?

4. How many more coyotes than bears did the hikers see?

5. How many animals did they see all together?

Lesson 7

Constructing Prisms

Let's Explore

Exploration 1: Cereal Box Net

Materials: Empty cereal box, Scissors or a craft knife, Pencil, Glue or tape

Procedures:

1. Glue or tape the top back together so that it is closed.

Get the help of an adult for the following:

2. Cut the two short EDGES and one long EDGE of the top.

> Box Top

3. Now the box top should still be connected at the back of the box.
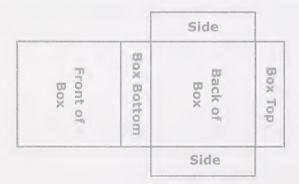
4. Cut down the two front edges of the box.

Front of
Box
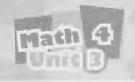
5. Now the front of the box is no longer attached to the side.

6. Cut along the edges that connect the sides of the box to the bottom of the box.

Box Bottom

7. Now you should have a flat shape that looks like this:

Side

Front of Box | Box Bottom | Back of Box | Box Top

Side

This is called a net of the box. This is one way all the faces can be connected and fold up to form a box. Are there other nets of the box that you can make?

8. Cut along all edges that are still connecting two faces of the box. Now you will have six rectangles or faces.

9. Use the cut out faces and see how many nets you can make that would fold up to make a box. You may want to use tape to keep the pieces together to test them.

10. Sketch a picture of each net.

Let's Explore

Exploration 2: Nets of a Cube

Materials: Grid paper from the back of this Unit in your Workbook, Page of Possible Nets from the back of this Unit in your Workbook, Scissors, Tape, Pencil

1. Cut out each net provided.

2. Test these nets by seeing if they will fold into a cube.
    Hint: There are less than 15 that form a cube.

3. Use the grid paper to shade in the squares to model each net.

4. Reflect: Why are some nets the same even when they look different on the grid paper?

Let's Explore

Exploration 3: Constructing a Triangular Prism

Materials: Triangular Prism Pattern from the back of this Unit in your Workbook, Card stock or cardboard, Scissors, Pencil, Glue or tape
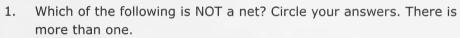
1. Cut out the triangular prism pattern.

2. Glue the pattern on top of your card stock.

3. Cut out the pattern along the bold black lines.

4. Fold along the dotted lines.

5. Fold the flaps in toward the middle of the prism.

6. Tape the edges of the prism together to create the prism.

7. Draw another pattern that would make a triangular prism.
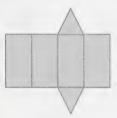
8. Reflect: What would happen to the nets of a triangular prism if the triangle side lengths are changed?

Let's Practice

1. Which of the following is NOT a net? Circle your answers. There is more than one.

a.

b.

c.

d.

e.

f.
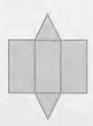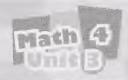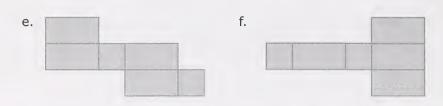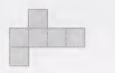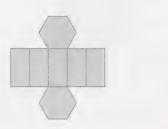
For 2 - 11: What type of net is shown?
rectangular prism, triangular prism, or not a prism

2. _____

3. _____

4. _____

5. _____
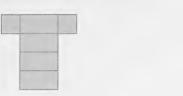
6. _____
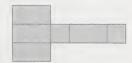
7. _____

8. _____

9. _____

10. _____

11. _____

12. Reflect: Explain how you can tell if a prism can be built by a given net.

Mixed Review

1. Which of the following is equal to ☐ ?

☐ + 8 = 12

a. 3
b. 4
c. 20
d. 24

2. Which of the following is equal to △ ?

   △ − 4.8 = 6

   a. 1.2
   b. 2.8
   c. 10.8
   d. 12.8

3. What is the pattern?

   14, 17, 20, 23, 26?
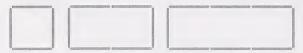
   a. add 2
   b. add 3
   c. subtract 3
   d. subtract 2

4. Lian has 12 jelly beans. Together, Daksha and Lian have 28 jelly beans. Which equation would allow you to find the number of jelly beans that Daksha has?
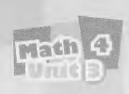
   a.   − 12 = 28
   b.   + 12 = 28
   c. 28 + 12 =
   d.   − 28 = 12
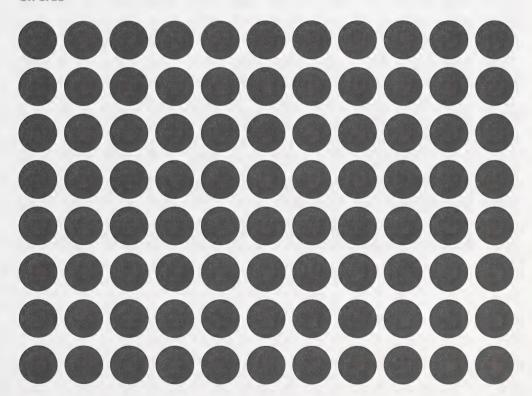
5. Cameron is making a pattern out of toothpicks. How many toothpicks will Cameron need to make the next figure?
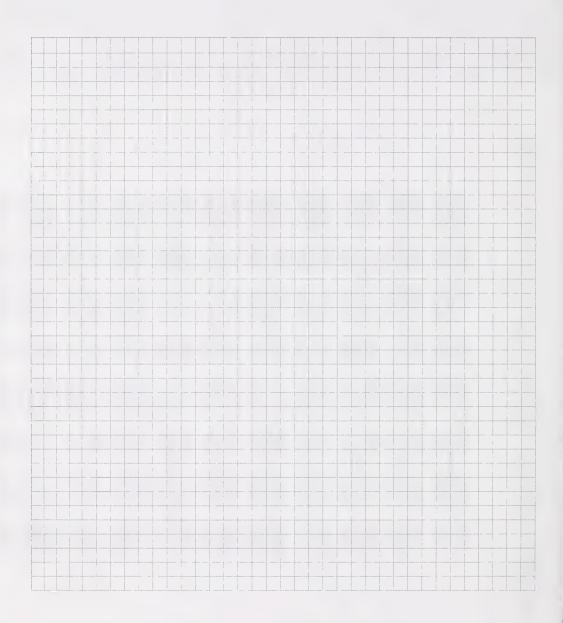
    a. 8
    b. 10
    c. 11
    d. 12

Lesson 2, Exploration 1

Circles

Lesson 2, Exploration 1

Squares

Lesson 2, Exploration 1

Rectangles

Lesson 2, Exploration 1
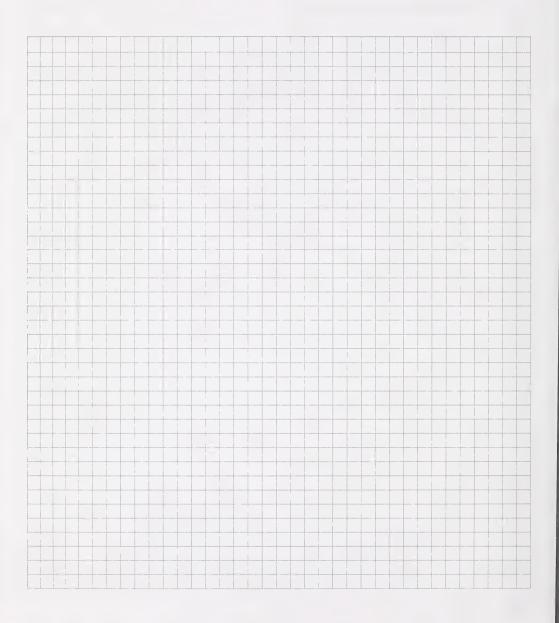
Figure 1

Figure 2
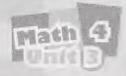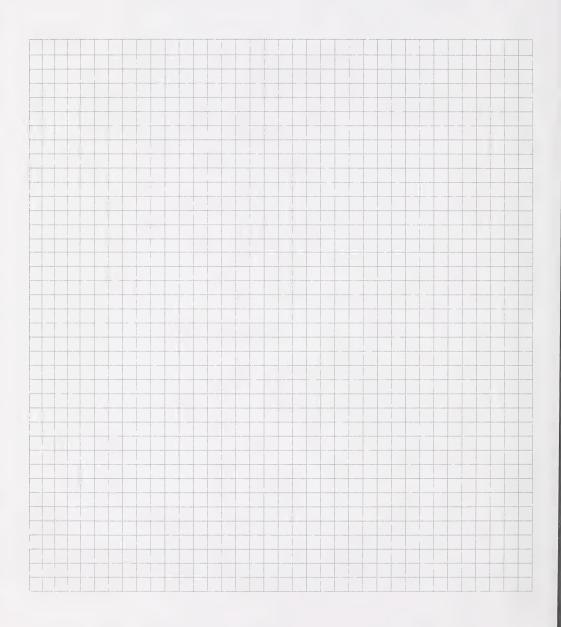
Lesson 2, Exploration 1

Figure 3

Figure 4

Lesson 2, Exploration 1
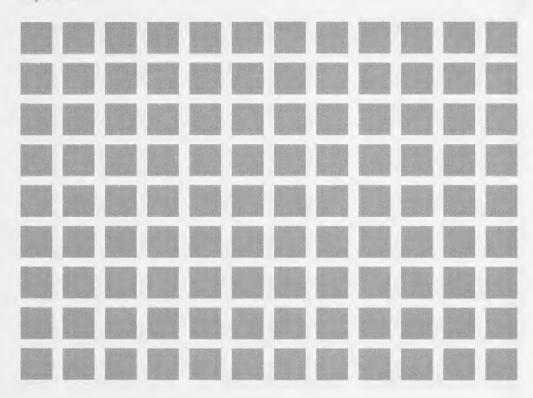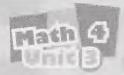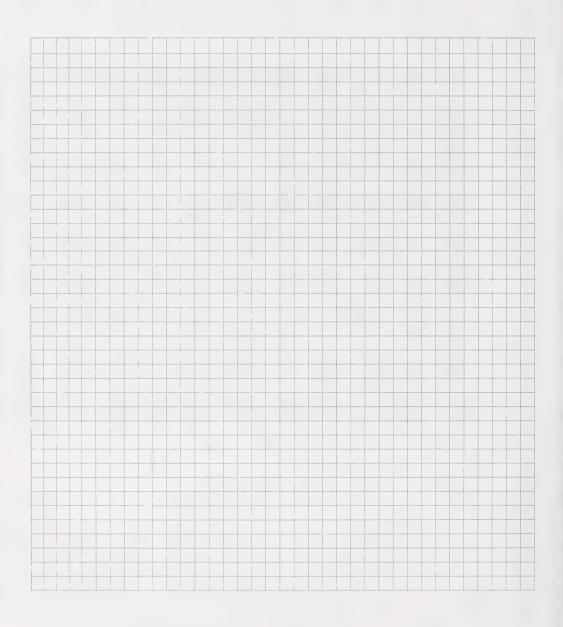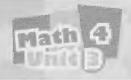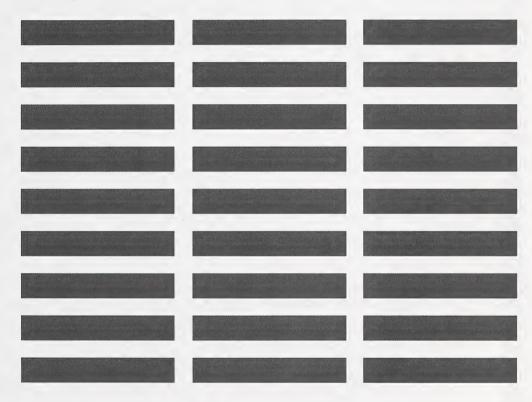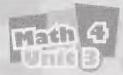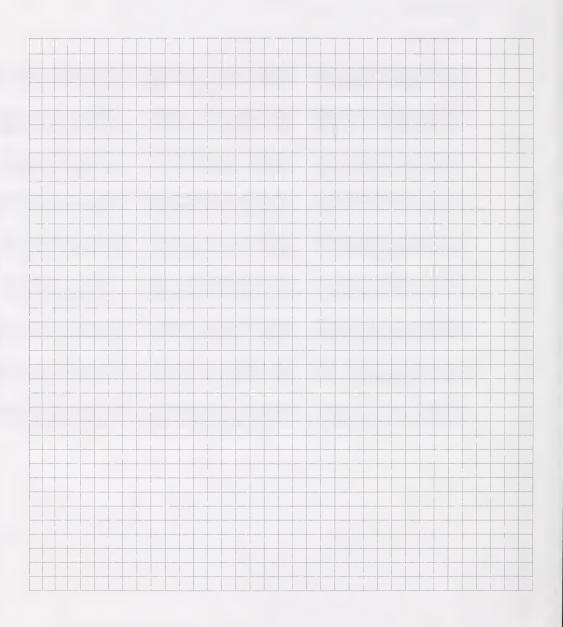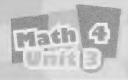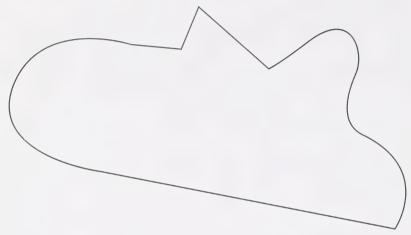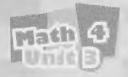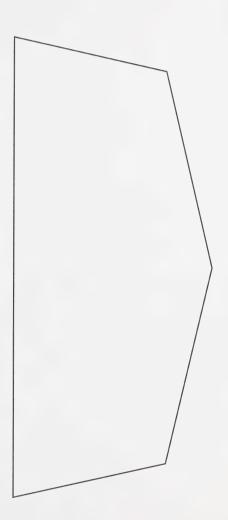
Figure 5
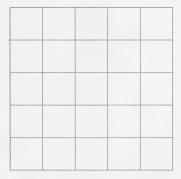
5 Centimetre Square
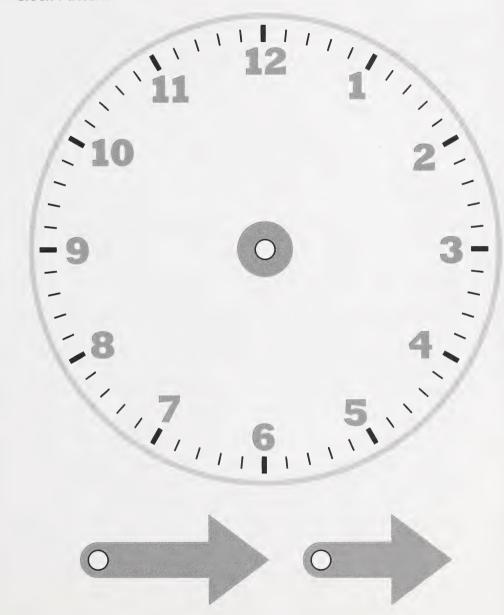
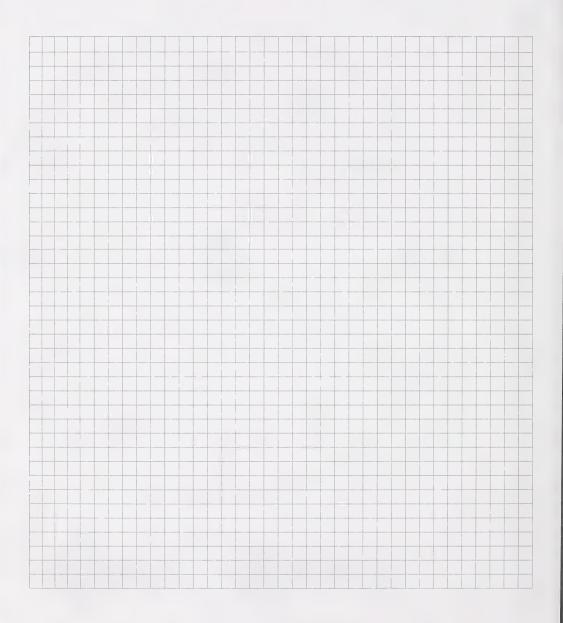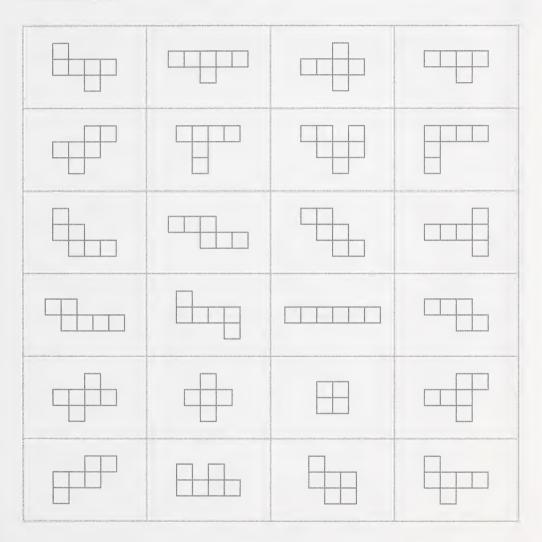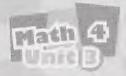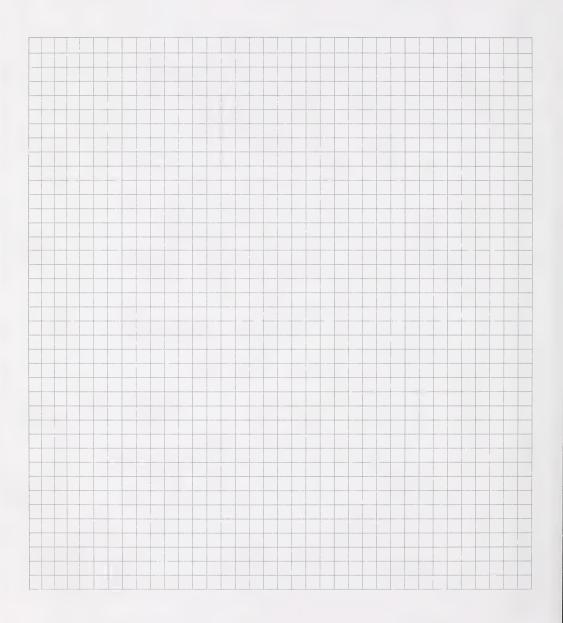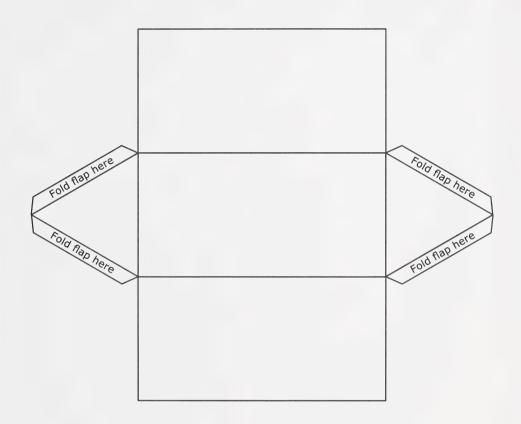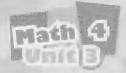Clock Pattern

Possible Nets
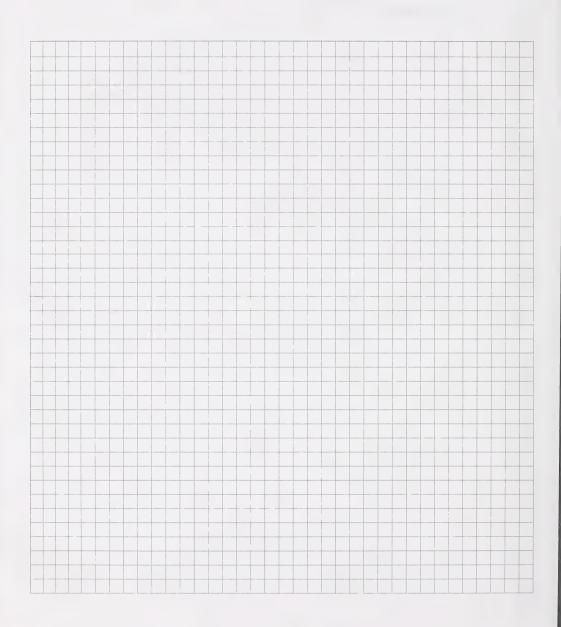
Triangular Pyramid Pattern

Fold flap here

Fold flap here

Fold flap here

Fold flap here

Grid Paper
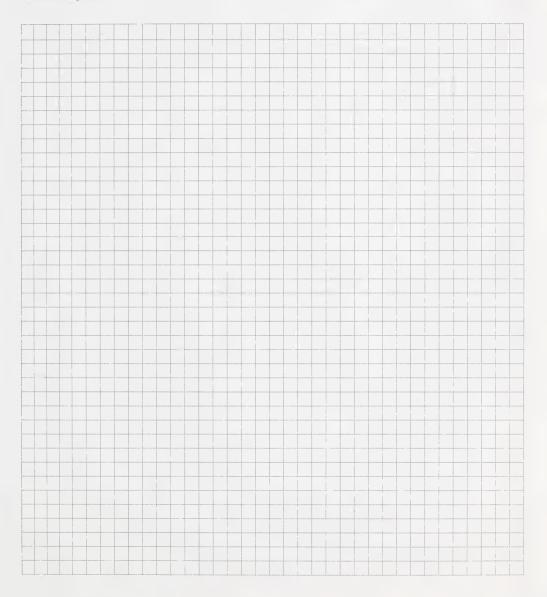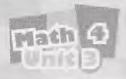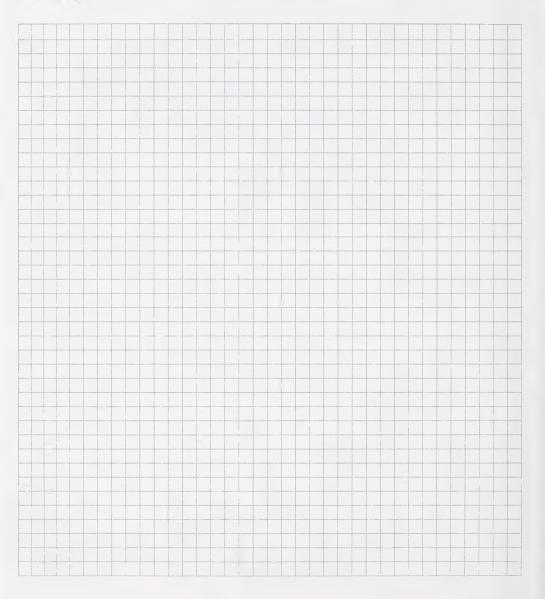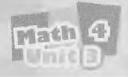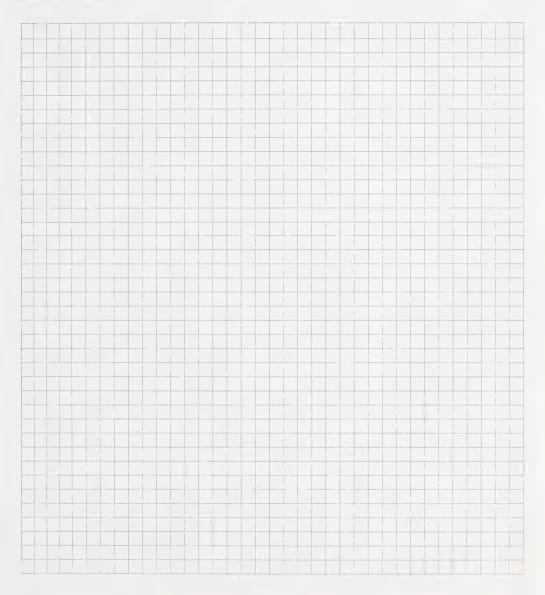
Grid Paper

Grid Paper

Centimetre Grid Paper

Centimetre Grid Paper

Centimetre Grid Paper

Lesson 1

Understanding Graphs
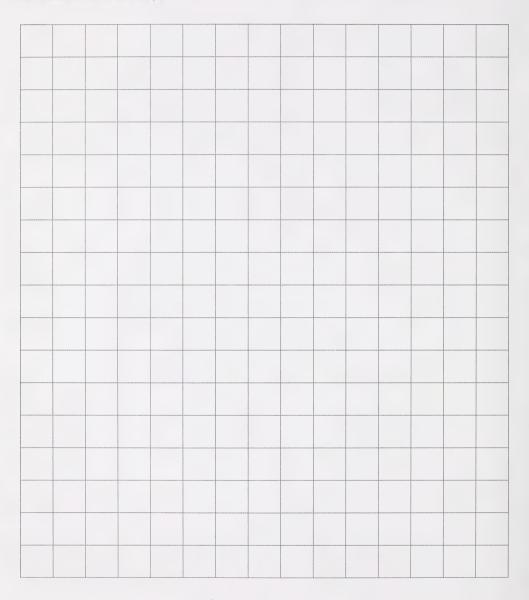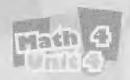
Let's Explore

Exploration 1: Interpreting Data

Materials: Pencil

20 boys and girls went on a Scout Camping trip. After the trip they completed a survey.

Here are two of the survey questions:

What is your favourite thing about camping?

a. roasting marshmallows
b. campfire time
c. outdoor activities
d. enjoying scenery

What is your favourite merit badge class?

a. archery
b. canoeing
c. cooking
d. swimming

Here are the results:

Camping Favourites

Roasting Marshmallows

Campfire Time

Outdoor Activities

Enjoying Scenery

= 2 Scouts

Favourite Badge Class

Number of Scouts

12
10
8
6
4
2
0

Archery   Canoeing   Cooking   Swimming

You may notice that the tents equal more than one scout's vote in the first graph. The scale for the second graph is also different than normal. Instead of marking all numbers it is counting by 2s.

Use the graphs to answer the following:

1. How many scouts chose roasting marshmallows for their favourite thing about camping?

2. How many scouts chose enjoying the scenery for their favourite thing about camping?

3. How many scouts chose canoeing as their favourite merit badge class?

4. How many scouts chose cooking as their favourite merit badge class?

5. The number of scouts who chose cooking as their favourite merit badge class is the same as what two classes combined?

6. What was the most popular merit badge class?

7. What was the most popular thing about camping?

8. How many more scouts liked cooking than swimming?

9. How many less scouts liked campfire time than outdoor activities?

10. How many scouts liked canoeing or swimming?

11. Write your own question about the Camping Favourites graph and answer it.

12. Write your own question about the Favourite Badge Class graph and answer it.

13. Reflect: Why do you think the creator of the graph made the tent equal to 2 scouts on the Camping Favourites graph?
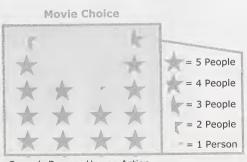
14. Reflect: Why do you think the creator of the graphs made the scale counting by twos on the Favourite Badge Class graph?

Let's Explore
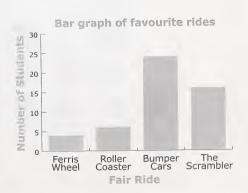
Exploration 2: Changing the Scale

Materials: Pencil

Look at these graphs again:

Movie Choice

★ = 5 People
★ = 4 People
★ = 3 People
★ = 2 People
★ = 1 Person

Comedy Drama Horror Action

Bar graph of favourite rides

Number of Students

Ferris Wheel   Roller Coaster   Bumper Cars   The Scrambler

Fair Ride
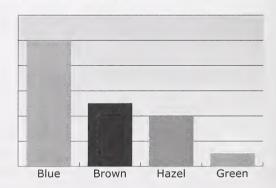
1. Why do you think the creator used a scale of "Star equals 5 people" for the pictograph?

2. What do you notice about the scale for the number of students on the Favourite Rides graph?

3. What is another scale you could use on the Favourite Rides graph?

These are graphs that represent a survey of 100 students:

Happy   Dazed   Grumpy   Mean   Blue   Brown   Hazel   Green

4. Write a survey question for the pictograph.

5. What would you use for a title on this graph?

6. What is the scale for each face in the graph if all together they represent 100?

7. Write a survey question for the bar graph.

8. What would you use for a title on this graph?

9.   What is the scale for this graph if all together the bars total 100?

10. Reflect: What if there were only 10 students surveyed? How would that change the scale?

Let's Practice

For 1 – 4: Find three different types of graphs in the media or on the Internet. Cut them out and tape them to a piece of paper. Use them to answer these questions.

1.   What types of graphs did you find?

2.   Name each graph and describe the scale of the graph.
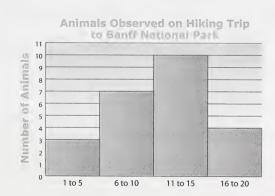
3.   Explain why each graph is the right type of graph for the data.

4.   Find a news story that could have a graph but does not.
     Which type of graph should you use for this story?
     What scale should you use?
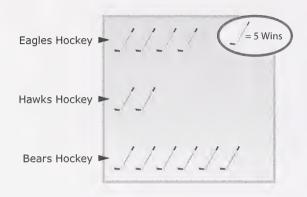
For 5 - 7: What is the scale for the given graphs?

5.   _____

Animals Observed on Hiking Trip
to Banff National Park

6. _____

Eagles Hockey ► / / / / /   _ / = 5 Wins

Hawks Hockey ► / /

Bears Hockey ► / / / / / / /

7. _____

Eye Colour

Blue	Brown	Hazel	Green

(bar graph: Blue = 50, Brown = 25, Hazel = 20, Green = 5; y-axis 0 to 60 in intervals of 10)
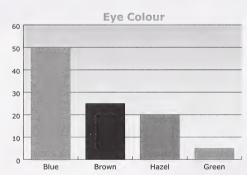
8. In the graph seen in number 7, explain why the creator used this scale.

For 9 - 11: Answer the following questions for each set of data:

A.   What graph should you use for the following data?

B.   What is an appropriate scale for a graph with this data?

9.   A. _____   B. _____

Number of Emails Received Each Day	Number of People
less than 10	30
10 to 20	65
21 to 30	35
31 to 40	15
over 40	5

10.   A. _____   B. _____
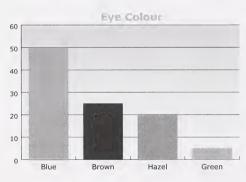
Destination	Number of Students
Beach	125
Mountains	250
City	75
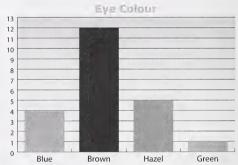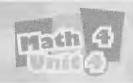
11. A. _____   B. _____

Day	Number of Horses
Monday	3
Tuesday	7
Wednesday	10
Thursday	12
Friday	18

12. Reflect: Compare the graphs. How are the graphs the same
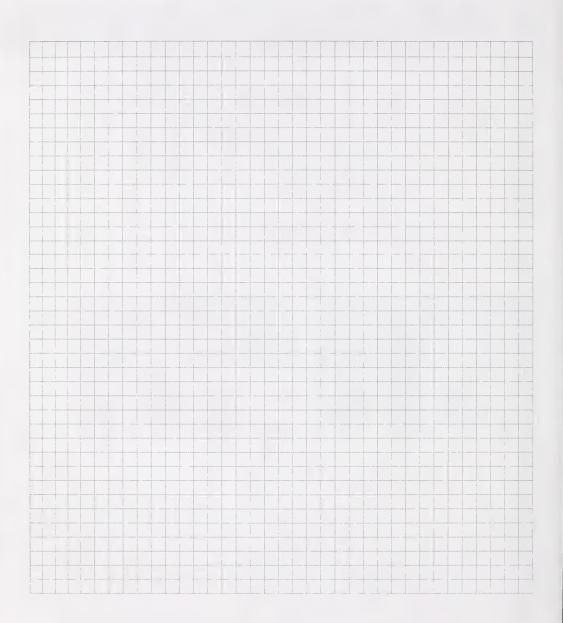   or different?

Mixed Review

Practice your multiplication facts.

1. 3 x 4 _____

2. 4 x 4 _____

3. 5 x 4 _____

4. 6 x 4 _____

5. 7 x 4 _____

6. Do you notice a pattern to the answers of problems 1 - 5?
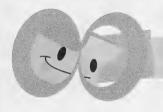   What is the pattern?

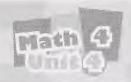# Lesson 2

Creating Graphs

Let's Explore

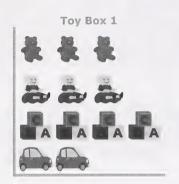## Exploration 1: What's In the Box?

Materials: Pencil

Alyssa's mom put three toy boxes on the floor in front of the kids.
She asked them to describe the contents of each box without looking.

To give them a hint she made these pictographs:

Toy Box 1   Toy Box 2   Toy Box 3

What is missing from these graphs? There are some missing parts to these graphs that would help you understand the symbols better.

1. What is missing from the pictographs?

2. What other information do you need?

3. Describe the contents you think are in Box 1.
    How did you get your answer?

4. Describe the contents you think are in Box 2.
    How did you get your answer?

5. Describe the contents you think are in Box 3.
    How did you get your answer?

Let's Explore

Exploration 2: Create a Pictograph

Materials: Pencil, Ruler, Pencil Crayons

You are surveying the neighbourhood about starting a community service project. One of your questions is:

Which group of people would you most like to help? (Choose one)
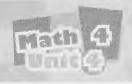
a. hungry
b. elderly
c. homeless
d. disabled

You are going to create a pictograph of the results. Your results are in the table shown:

Group	Number of Votes
Hungry	45
Elderly	20
Homeless	75
Disabled	25

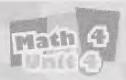1. What would you use for a title?

2. What are your categories?

3. What will be your symbol or symbols?

4. What does each symbol represent? Be careful! Do you want each to represent 1 or more than 1?

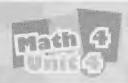5. Create your pictograph. Remember to include all parts of your graph.

Let's Explore

Exploration 3: Creating a Bar Graph

Materials: Pencil, Pencil Crayon

Lian went on a camping trip with her family. The data table shows what she collected on her week long trip.

Create a bar graph for the data using this template. Remember to label all parts. Clearly label the scale.

Lian's Collection	
Item	Number
Snails	15
Pine cones	60
Fireflies	45
Rocks	50

Let's Practice

For 1 - 2: Use the pictograph to answer the following questions.

Communication Methods

Phone   Email   Mail

1. The total number of students in the survey is 100.
    Make a legend for the pictograph.

2. Write a survey question that would match this graph.

For 3 - 4: Children were surveyed on what they most like to do on a Saturday. Here are the results:

Activity	Number of Children
Play Outside	40
Video Games	80
TV	60
Computer	50

3. In the space below create a pictograph to display the data.

4. Write 3 questions for other students to answer about your pictograph. Next, write the answers to the questions:

For 5 - 8: A group of students were surveyed about the sports they play outside of school. Here are the results:
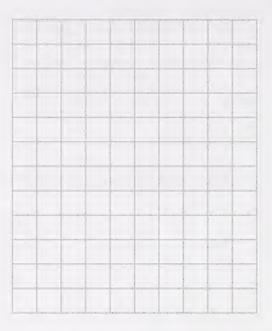
Sport	Number of kids
Ice Hockey	120
Baseball	80
Figure skating	60
Soccer	95

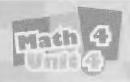5.   What is a good title for a bar graph with this information?

6.   What scale would you use?

7. Create a bar graph for the data in the bar graph template.

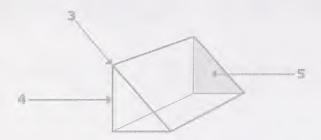8. Write 3 questions that other students could answer about your bar graph, and answer them:

Mixed Review

1.   Draw as many rectangles as you can with an area of 24 square units.

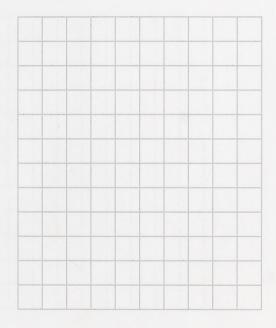For 2 – 5: Use the figure to answer the following questions:

2.   What is the name of this figure?

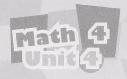3.   What is the name of this part of the figure?

4.   What is the name of this part of the figure?

5.   What is the name of this part of the figure?

Bar Graph Template

Bar Graph Template